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Economic Impact Analysis of HB 198 on Illinois Small Businesses and Their Employees

This report analyzes the potential economic impact of implementing a proposal currently under discussion to increase the minimum wage to $15.00 per hour in Illinois. Currently, legislators in Illinois are considering a plan that would increase the minimum wage from $8.25 an hour to $9.00 per hour on January 1, 2018, $10.00 per hour on January 1, 2019, $11.25 per hour on January 1, 2020, $13.00 per hour on January 1, 2021, and, finally, $15.00 per hour on January 1, 2022. Such increases in the minimum wage would also have the effect of increasing the mandatory cash wage (set equal to at least 60 percent of the effective state minimum wage by Illinois law) paid by employers to tipped employees.

Using the Business Size Insight Module (BSIM), a dynamic, multi-region model based on the Regional Economic Models, Inc. (REMI) structural economic forecasting and policy analysis model which integrates input-output, computable general equilibrium, econometric, and economic geography methodologies, it was estimated that over a ten-year period beginning in 2018, the proposed wage schedule would reduce Illinois private sector employment by over 93,000 jobs and result in a cumulative reduction in Illinois real output of over $56 billion over the ten-year forecast window. Nearly 56 percent of the forecast job losses are jobs that would have been in the small business sector of the economy.

Introduction

Employers in all fifty states are required to offer workers a minimum wage in exchange for their labor. The primary federal statute in the area of minimum wages is the Fair Labor Standards Act (FLSA) of 1938 which, as amended, establishes a basic minimum wage that must be paid to covered workers. The current federal minimum wage is $7.25 per hour. States are permitted to establish their own minimum wages which have the potential to replace the federal rate as the basic minimum wage, provided that the state minimum wage established exceeds the federal rate. The effective minimum wage in the state of Illinois is currently $8.25 per hour (**Table 1**), $1.00 per hour higher than federal rate.

Table 1: Historical Effective Minimum Wage Rates for Non-farm Employment in Illinois

Year	Minimum Wage	Year	Minimum Wage
1976	$2.30 (per hour)	1997	$4.75
1977	$2.30	1998	$5.15
1978	$2.65	1999	$5.15
1979	$2.90	2000	$5.15
1980	$3.10	2001	$5.15
1981	$3.35	2002	$5.15
1982	$3.35	2003	$5.15
1983	$3.35	2004	$5.50
1984	$3.35	2005	$6.50
1985	$3.35	2006	$6.50
1986	$3.35	2007	$6.50
1987	$3.35	2008	$7.50
1988	$3.35	2009	$7.75
1989	$3.35	2010	$8.00
1990	$3.35	2011	$8.25
1991	$3.80	2012	$8.25
1992	$4.25	2013	$8.25
1993	$4.25	2014	$8.25
1994	$4.25	2015	$8.25
1995	$4.25	2016	$8.25
1996	$4.25	2017	$8.25

Source: Department of Labor

Despite an increase of 27 percent in the effective minimum wage in Illinois since 2007, proponents of a higher minimum wage continue to push for additional increases. A proposal currently under consideration by state legislators would increase the minimum wage from $8.25 an hour to $9.00 an hour immediately, followed by increasingly large annual raises until the minimum wage reaches $15.00 per hour in 2022. This represents a near doubling of the minimum wage in just a handful of years.

This brief report quantifies the potential economic impacts implementation of the proposed minimum wage increase might have on Illinois small businesses and their employees by using the Business Size Insight Module. The BSIM is a dynamic, multi-region model based on the Regional Economic Models, Inc. (REMI) structural economic forecasting and policy analysis model which integrates input-output, computable general equilibrium, econometric, and economic geography methodologies. The underlying mechanics of the REMI model are based on decades of peer-reviewed literature.[1] The model is used by numerous clients in both the private and public sectors.[2] The BSIM is a customized version of the REMI model that has the unique ability to forecast the economic impact of public policy and proposed legislation on different categories of U.S. businesses differentiated by employee-size-of-firm. Forecast variables include levels of private sector employment and real output. By comparing simulation results for scenarios which include proposed or yet-to-be-implemented policy changes with the model's baseline forecast, the BSIM is able to obtain estimates of how these policy changes would impact employer firms and their employees.

Description of New Employer Costs Under the Proposed Minimum Wage Increase in Illinois

Minimum wage increases raise the cost of labor for employers.[3] The proposed increase in the Illinois minimum wage directly raises the cost of labor by mandating increases to the state minimum wage from $8.25 this year to $9.00 in 2018 and, ultimately, to $15.00 by 2022 through increasingly large annual raises. Raising the minimum wage to $15.00 per hour from its current level is equivalent to raising the cost of labor for employers of minimum wage workers by 82 percent. This increase to the cost of labor is not inconsequential. According to the Bureau of Labor Statistics, there are 19,000 workers in Illinois who currently earn the minimum wage and would be directly and immediately affected by an increase in the state minimum wage.[4]

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[1] A list of the peer-reviewed literature is available at http://www.remi.com/download/model-equations-v2-0?wpdmdl=7783. The list of references includes articles published in the American Economic Review and The Review of Economics and Statistics.

[2] The REMI model is used by a diverse group of clients spanning academia, private consulting firms, local and regional governments, and nonprofits, to name a few categories. A list of clients that use the REMI model is available at http://www.remi.com/clients. The list has included consultancies like Boston Consulting Group and Ernst and Young, educational institutions like the Massachusetts Institute of Technology, nonprofit institutions like AARP and the Urban Institute, and federal, regional, and local government agencies.

[3] Good overviews of the literature on the minimum wage can be found in:

Brown, Charles, Curtis Gilroy, and Andrew Cohen, "The Effect of the Minimum Wage on Employment and Unemployment: A Survey," NBER Working Paper No. 846, January 1982;

Neumark, David and William Wascher, "Minimum Wages, Labor Market Institutions, and Youth Employment: A Cross-National Analysis," Industrial and Labor Relations Review, Vol. 57, No. 2, January 2004.

[4] "Characteristics of Minimum Wage Workers: 2015," Table 3, Bureau of Labor Statistics, http://www.bls.gov/opub/reports/minimum-wage/2015/pdf/home.pdf.

Table 2: Illinois Minimum Wage Trajectories Under HB 198

Year	Hypothetical Minimum Wage Schedule under Current Proposal	Hypothetical Percentage Increase in Illinois Minimum Wage (Compared to Status Quo)
2017	$8.25 (per hour)	N/A
2018	$9.00	9.1%
2019	$10.00	21.2%
2020	$11.25	36.4%
2021	$13.00	57.6%
2022	$15.00	81.8%
2023	$15.00	81.8%
2024	$15.00	81.8%
2025	$15.00	81.8%
2026	$15.00	81.8%
2027	$15.00	81.8%

Moreover, this increase in the Illinois minimum wage would have a substantial impact on the cash wage that employers must pay to "tipped" employees. According to the U.S. Department of Labor (DOL), tipped employees are employees who "customarily and regularly receive more than $30 per month in tips."[5] Employers may use tips received by such employees as a credit against their minimum wage obligations to the employees, provided that a minimum cash wage, currently set to $2.13 per hour at the federal level, is also paid to the employees.

States have the option of establishing their own cash wage. The cash wage in Illinois is currently set to $4.95 per hour, nearly three dollars higher than the federal minimum. According to the Bureau of Labor Statistics, there are 57,000 Illinois workers who earn below the minimum wage. Tipped employees are required by law to earn the minimum wage through a sum of cash wages, tips, food, and lodging. Also by law, the minimum cash wage in Illinois is currently set equal to 60 percent of the effective state minimum wage. HB 198 maintains this cash wage minimum, meaning that the bill would increase the minimum cash wage to $5.40 per hour in 2018, $6.00 per hour in 2019, $6.75 per hour in 2020, $7.80 per hour in 2021, and $9.00 per hour in 2022.

A second issue a modeler must concern himself with when modeling an increase in the state minimum wage is business size exemptions. Some states exempt businesses of a certain size from minimum wage requirements. Illinois currently exempts employer firms with three or fewer employees from minimum wage laws. HB 198 would ignore this exemption and impose a mandatory minimum wage on even the smallest of employers, leaving no businesses of any size-of-firm group free from the mandate.

A third issue takes the form of potential "emulation effects" associated with individuals earning near (just above) the current minimum wage. Some of these individuals will earn between $8.25 per hour and the higher wages mandated in subsequent years (beginning with $9.00 per hour

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[5] For detailed information on tipped employees, a useful resource is the DOL fact sheet available here: http://www.dol.gov/whd/regs/compliance/whdfs15.pdf.

in 2018). In the absence of employer action, these workers will see their wages raised automatically to these new levels contingent upon the passage of the bill. However, wages for these workers may increase to even higher levels if employers attempt to maintain the pre-implementation wage structure and raise wages for these workers to levels above the new minimum wage. Failure to increase the wages of near-minimum-wage earners sufficiently and allowing wage compression to occur may result in workers expressing their dissatisfaction by reducing work effort or leaving. Research suggests that "relative wages are important to workers," and "firms may find it in their profit-maximizing interest to increase [near-minimum-wage] workers' wages when minimum wages increase, in an attempt to restore work effort."[6] For the modeler, a key concern involves estimating how many workers can be expected to contribute to such emulation effects. Based upon state-level data from the Bureau of Labor Statistics, for this analysis, it was adjudged that 15 percent[7] of Illinois's private sector employees less those individuals earning at or below the minimum wage would also see per capita raises equal to the dollar amount in wage increases experienced by workers earning *at* the minimum wage in years 2018 and beyond.[8]

Besides the direct cost of higher wages in an increased minimum wage scenario, there are significant additional employer costs in the form of additional payroll taxes that must be paid on wage differentials. In general, an employer's share of payroll taxes equals 7.65 percent of employee wages and salary. Of this 7.65 percent, 6.2 percentage points are intended to help fund old age, survivors, and disability insurance, and 1.45 percentage points go toward helping to pay for Medicare hospital insurance. Employers can expect to pay more in payroll taxes as a consequence of a minimum wage increase.

No Changes to Government Demand

Given that a mandated minimum wage has been in effect for decades, it is assumed that government mechanisms to monitor compliance with the statute are established and well-developed. An increase in the minimum wage therefore should not require the development of

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[6] Grossman, Jean Baldwin, "The Impact of the Minimum Wage on Other Wages," The Journal of Human Resources, Vol. 18, No. 3 (Summer 1983).

[7] According to the Bureau of Labor Statistics, Illinois wage earners at the 10th percentile earn $9.31 per hour, while those at the 25th percentile earned $11.57 per hour. Emulation effects can be assumed to occur among workers who earn near (within a few dollars of) the minimum wage. Some workers at the 15th percentile may earn above the proposed wage level of $9.00 in 2018, but all workers at the 15th percentile earn below the proposed "final" wage level of $15.00 per hour. These workers would eventually and automatically see their wages increase to the new minimum wage of $15.00 in a few years if the proposal was passed and implemented, all else unchanged, but a reasonable scenario is that these workers will press for the restoration of the original wage structure. It is assumed that emulation effects do not occur for workers earning above the 15th percentile. For workers earning at or below the 15th percentile, it is assumed that earnings increase by $0.75 per hour in 2018 if the act is implemented, by an additional $1.00 per hour in 2019, and so on and so forth.

[8] The assumption that wage changes due to emulation effects occur simultaneously with the minimum wage increase is supported by research suggesting that "any substantial emulation effects are not long delayed, which seems plausible because increases in the minimum are [typically] well-advertised in advance." See Gramlich, Edward M., "Impact of Minimum Wages on Other Wages, Employment, and Family Incomes," *Brookings Papers on Economic* Activity, The Brookings Institution, 1974, downloadable at: http://www.brookings.edu/~/media/projects/bpea/1976%202/1976b_bpea_gramlich_flanagan_wachter.pdf.

new government mechanisms or materially increase government administrative costs. Hence, the analysis assumes no projected increases in government demand resulting from the implementation of the proposed minimum wage increase.

Additional Private Spending in the Economy

Consumers in an economy have two choices of what to do with their after-tax income. They can either choose to spend it, thereby increasing consumption within the economy, or they can elect to save it, and in doing so potentially increase investment in the economy. Government stimulus programs frequently focus on transferring wealth to lower-earning individuals because of the strong likelihood that these individuals will elect to spend the additional wealth, producing a consumption-fueled boost to the economy, rather than to save.[9] Consistent with expectations pertaining to increases in income for low-income workers, this analysis assumes that new additional income received by minimum wage earners is spent (and not saved), leading to an increase in consumption.

In the analysis, the conversion of higher labor costs for employers into increased consumption by workers receiving wage increases occurs automatically due to the way in which wage costs are inputted into the BSIM. Since employer costs described in this analysis derive from an increase in the minimum wage, the costs were inputted into the BSIM under the "Wage Labor Cost" variable. The costs were distributed across different industry categories and different employee-size-of-business categories according to existing industry and business size distributions published in the Census Bureau's Statistics on U.S. Businesses dataset. This distribution allows the BSIM to generate results for separate employee-size-of-firm categories.

Increases in the "Wage Labor Cost" variable in the BSIM translate directly to increases in the "Compensation Rate" policy variable which is used in intermediate calculations during the simulation process. During simulations, such compensation rate increases are directly "fed back" into the economy in the form of higher consumer spending on the part of workers who now have extra money to spend. Such dynamics are important in a minimum wage simulation since, as mentioned previously, it is believed that during cases involving the transfer of wealth to lower-earning individuals, there is a strong likelihood that these individuals will elect to spend the additional wealth (rather than save), producing a consumption-fueled boost to the economy. Concerns that minimum wage increases may provide a countervailing spending "stimulus" effect to the economy are therefore satisfied automatically in this analysis.[10]

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[9] According to the Congressional Budget Office, "increases in disposable income are likely to boost purchases more for lower-income than for higher-income households. That difference arises, at least in part, because a larger share of people in lower-income households cannot borrow as much money as they would wish in order to spend more than they do currently." See: "The Economic Outlook and Fiscal Policy Choices: Statement of Douglas W. Elmendorf, before the Committee on the Budget, United States Senate," Congressional Budget Office, September 28, 2010, p. 36.

[10] The fact that the BSIM automatically accounts for an increase in consumer spending as a consequence of an increase in the "Wage Labor Cost" variable is an important point that should not be missed. That increased consumption is automatically accounted for by the model in an analysis of a minimum wage increase means that

Simulation Results

BSIM simulation results for the modeled scenario in which the minimum wage proposal becomes law are provided below. All employment figures are expressed as number of employees, while output figures are expressed as billions of 2015 dollars. Under the above assumptions, job losses forecast in year 2027 exceed 93,000 (**Table 3**). More precisely, the BSIM forecasts that there will be more than 93,000 fewer jobs in 2027 due to the house bill's mandated increase in the cost of labor than there otherwise would have been (if the bill had not been implemented). More than 55 percent of the forecast jobs lost are jobs that would have been in the small business sector of the economy. At a sectoral level, food services and drinking places (a sub-industry of the NAICS "leisure and hospitality" industry category) and retail trade are forecast to experience significant job losses (**Table 4** and **Table 5**). The BSIM forecasts that in 2027, there will be over 10,800 fewer jobs in food services and drinking places (11.6 percent of all jobs lost).

In addition to forecast reductions in employment, real output[11] is also projected to decrease by approximately $13.2 billion by 2027 (**Table 6**). Over the ten-year forecast window, the *cumulative* real output lost exceeds $56 billion (**Table 7**). Nearly half (46 percent) of the cumulative reduction in real output is expected to occur in the small business sector of the economy.

Table 3: Employment Difference from Baseline (Number of Employees) Under HB 198

Firm Size	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Percent of Total (2026)
1-4 Employees	-59	-249	-619	-1,214	-2,052	-3,076	-4,138	-5,105	-5,901	-6,499	7.0%
5-9 Employees	-114	-387	-865	-1,605	-2,603	-3,638	-4,666	-5,584	-6,331	-6,884	7.4%
10-19 Employees	-101	-367	-866	-1,669	-2,783	-3,944	-5,103	-6,141	-6,985	-7,610	8.1%
20-99 Employees	-248	-896	-2,083	-3,975	-6,577	-9,216	-11,772	-14,027	-15,840	-17,166	18.4%
100-499 Employees	-242	-859	-1,917	-3,518	-5,656	-7,815	-9,799	-11,504	-12,858	-13,846	14.8%
500 + Employees	-673	-2,591	-5,941	-11,019	-17,843	-24,529	-30,288	-35,071	-38,764	-41,385	44.3%
< 20 Employees	-275	-1,003	-2,350	-4,489	-7,438	-10,659	-13,907	-16,831	-19,217	-20,993	22.5%
< 100 Employees	-523	-1,899	-4,434	-8,464	-14,014	-19,875	-25,679	-30,859	-35,056	-38,159	40.9%
< 500 Employees	-765	-2,758	-6,351	-11,982	-19,670	-27,690	-35,478	-42,363	-47,914	-52,005	55.7%
All Firms	**-1,438**	**-5,348**	**-12,292**	**-23,001**	**-37,513**	**-52,218**	**-65,766**	**-77,434**	**-86,678**	**-93,390**	**100.0%**

exogenous increases in private sector demand are unnecessary for a model to be complete. Including such exogenous increases makes the resulting forecasts conservative.

[11] The term "output" refers to the aggregate output of the Illinois economy (IL gross domestic product (GDP)). GDP has three possible definitions: (1) the value of final goods and services produced in an economy during a given period (as opposed to raw materials or intermediate goods which are produced or sourced earlier in the production process), (2) the sum of value added during a given period, or (3) the sum of incomes in the economy during a given period. It is a technical term whose significance may be better understood by the reader if she considers that because of the first definition, output serves as a rough proxy for sales.

Table 4: Employment Difference from Baseline (Number of Employees) Under HB 198, Food Services and Drinking Places

Firm Size	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Percent of Total (2027)
1-4 Employees	-21	-54	-99	-164	-241	-279	-309	-334	-353	-367	3.4%
5-9 Employees	-36	-93	-171	-283	-415	-480	-533	-575	-609	-632	5.8%
10-19 Employees	-67	-171	-316	-522	-766	-887	-984	-1,062	-1,124	-1,167	10.8%
20-99 Employees	-179	-460	-849	-1,402	-2,058	-2,383	-2,643	-2,854	-3,020	-3,136	29.0%
100-499 Employees	-79	-202	-373	-616	-904	-1,046	-1,161	-1,253	-1,326	-1,377	12.7%
500 + Employees	-237	-607	-1,121	-1,850	-2,717	-3,146	-3,489	-3,767	-3,987	-4,140	38.3%
< 20 Employees	-124	-318	-587	-968	-1,421	-1,646	-1,825	-1,971	-2,086	-2,166	20.0%
< 100 Employees	-303	-778	-1,436	-2,370	-3,479	-4,029	-4,469	-4,825	-5,106	-5,303	49.0%
< 500 Employees	-382	-980	-1,809	-2,985	-4,383	-5,075	-5,629	-6,078	-6,433	-6,680	61.7%
All Firms	**-619**	**-1,588**	**-2,930**	**-4,836**	**-7,099**	**-8,221**	**-9,118**	**-9,845**	**-10,420**	**-10,820**	**100.0%**

Table 5: Employment Difference from Baseline (Number of Employees) Under HB 198, Retail Trade

Firm Size	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Percent of Total (2027)
1-4 Employees	6	1	-17	-49	-103	-180	-251	-313	-364	-404	4.4%
5-9 Employees	7	2	-20	-60	-126	-220	-307	-383	-445	-494	5.4%
10-19 Employees	7	2	-21	-63	-130	-228	-317	-396	-461	-511	5.6%
20-99 Employees	15	3	-46	-135	-281	-493	-685	-856	-995	-1,104	12.1%
100-499 Employees	10	2	-29	-85	-176	-309	-430	-537	-625	-693	7.6%
500 + Employees	82	19	-246	-727	-1,512	-2,649	-3,685	-4,603	-5,353	-5,936	64.9%
< 20 Employees	20	4	-58	-172	-359	-629	-875	-1,093	-1,271	-1,409	15.4%
< 100 Employees	35	8	-104	-308	-640	-1,121	-1,560	-1,948	-2,266	-2,513	27.5%
< 500 Employees	44	10	-133	-392	-816	-1,431	-1,990	-2,485	-2,890	-3,205	35.1%
All Firms	**127**	**29**	**-379**	**-1,119**	**-2,328**	**-4,080**	**-5,675**	**-7,089**	**-8,244**	**-9,141**	**100.0%**

Table 6: Real Output Difference from Baseline (Billions of 2015 Dollars) Under HB 198

Firm Size	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Percent of Total (2027)
1-4 Employees	$0.019	$0.034	$0.035	$0.018	-$0.030	-$0.153	-$0.295	-$0.434	-$0.551	-$0.643	4.9%
5-9 Employees	$0.011	$0.014	$0.000	-$0.036	-$0.104	-$0.226	-$0.361	-$0.489	-$0.596	-$0.680	5.2%
10-19 Employees	$0.011	$0.012	-$0.010	-$0.060	-$0.150	-$0.299	-$0.460	-$0.612	-$0.739	-$0.838	6.4%
20-99 Employees	$0.012	-$0.015	-$0.108	-$0.283	-$0.565	-$0.965	-$1.371	-$1.741	-$2.045	-$2.279	17.3%
100-499 Employees	-$0.002	-$0.051	-$0.164	-$0.355	-$0.645	-$1.013	-$1.366	-$1.676	-$1.926	-$2.116	16.1%
500 + Employees	-$0.021	-$0.214	-$0.625	-$1.294	-$2.278	-$3.446	-$4.494	-$5.388	-$6.094	-$6.622	50.3%
< 20 Employees	$0.041	$0.060	$0.025	-$0.078	-$0.284	-$0.678	-$1.116	-$1.535	-$1.886	-$2.161	16.4%
< 100 Employees	$0.053	$0.045	-$0.083	-$0.361	-$0.849	-$1.643	-$2.487	-$3.276	-$3.931	-$4.440	33.7%
< 500 Employees	$0.051	-$0.006	-$0.247	-$0.716	-$1.494	-$2.656	-$3.853	-$4.952	-$5.857	-$6.556	49.7%
All Firms	**$0.030**	**-$0.220**	**-$0.872**	**-$2.010**	**-$3.772**	**-$6.102**	**-$8.347**	**-$10.340**	**-$11.951**	**-$13.178**	**100.0%**

Table 7: Cumulative Real Output Difference from Baseline (Billions of 2015 Dollars) Under HB 198

Firm Size	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Percent of Total (2027)
1-4 Employees	$0.019	$0.053	$0.088	$0.106	$0.076	-$0.077	-$0.372	-$0.806	-$1.357	-$2.000	3.5%
5-9 Employees	$0.011	$0.025	$0.025	-$0.011	-$0.115	-$0.341	-$0.702	-$1.191	-$1.787	-$2.467	4.3%
10-19 Employees	$0.011	$0.023	$0.013	-$0.047	-$0.197	-$0.496	-$0.956	-$1.568	-$2.307	-$3.145	5.5%
20-99 Employees	$0.012	-$0.003	-$0.111	-$0.394	-$0.959	-$1.924	-$3.295	-$5.036	-$7.081	-$9.360	16.5%
100-499 Employees	-$0.002	-$0.053	-$0.217	-$0.572	-$1.217	-$2.230	-$3.596	-$5.272	-$7.198	-$9.314	16.4%
500 + Employees	-$0.021	-$0.235	-$0.860	-$2.154	-$4.432	-$7.878	-$12.372	-$17.760	-$23.854	-$30.476	53.7%
< 20 Employees	$0.041	$0.101	$0.126	$0.048	-$0.236	-$0.914	-$2.030	-$3.565	-$5.451	-$7.612	13.4%
< 100 Employees	$0.053	$0.098	$0.015	-$0.346	-$1.195	-$2.838	-$5.325	-$8.601	-$12.532	-$16.972	29.9%
< 500 Employees	$0.051	$0.045	-$0.202	-$0.918	-$2.412	-$5.068	-$8.921	-$13.873	-$19.730	-$26.286	46.3%
All Firms	**$0.030**	**-$0.190**	**-$1.062**	**-$3.072**	**-$6.844**	**-$12.946**	**-$21.293**	**-$31.633**	**-$43.584**	**-$56.762**	**100.0%**

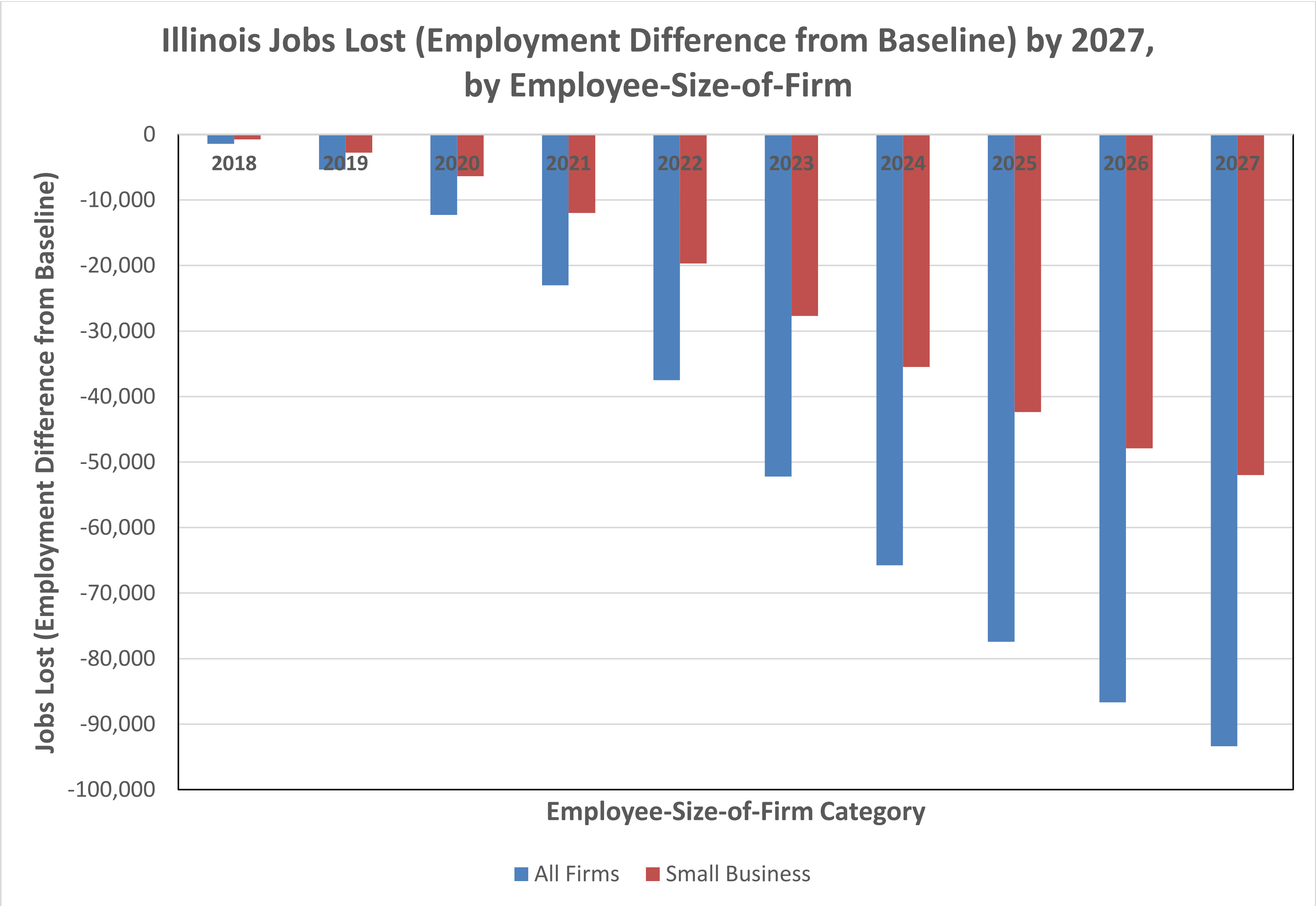

Illinois Jobs Lost (Employment Difference from Baseline) by 2027, by Employee-Size-of-Firm
0
-10,000
-20,000
-30,000
-40,000
-50,000
-60,000
-70,000
-80,000
-90,000
-100,000
Jobs Lost (Employment Difference from Baseline)
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
Employee-Size-of-Firm Category
All Firms
Small Business

Figure 1

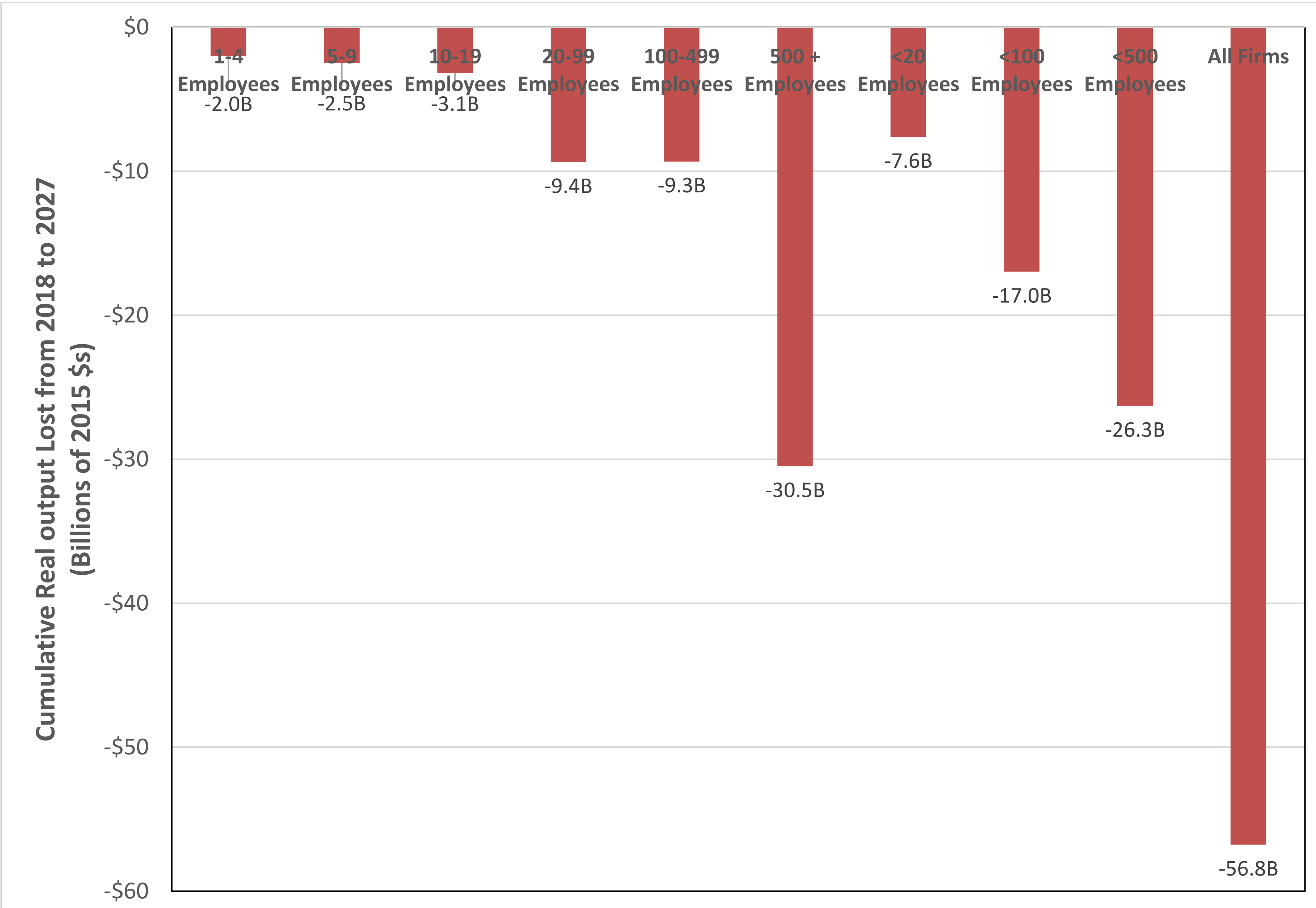
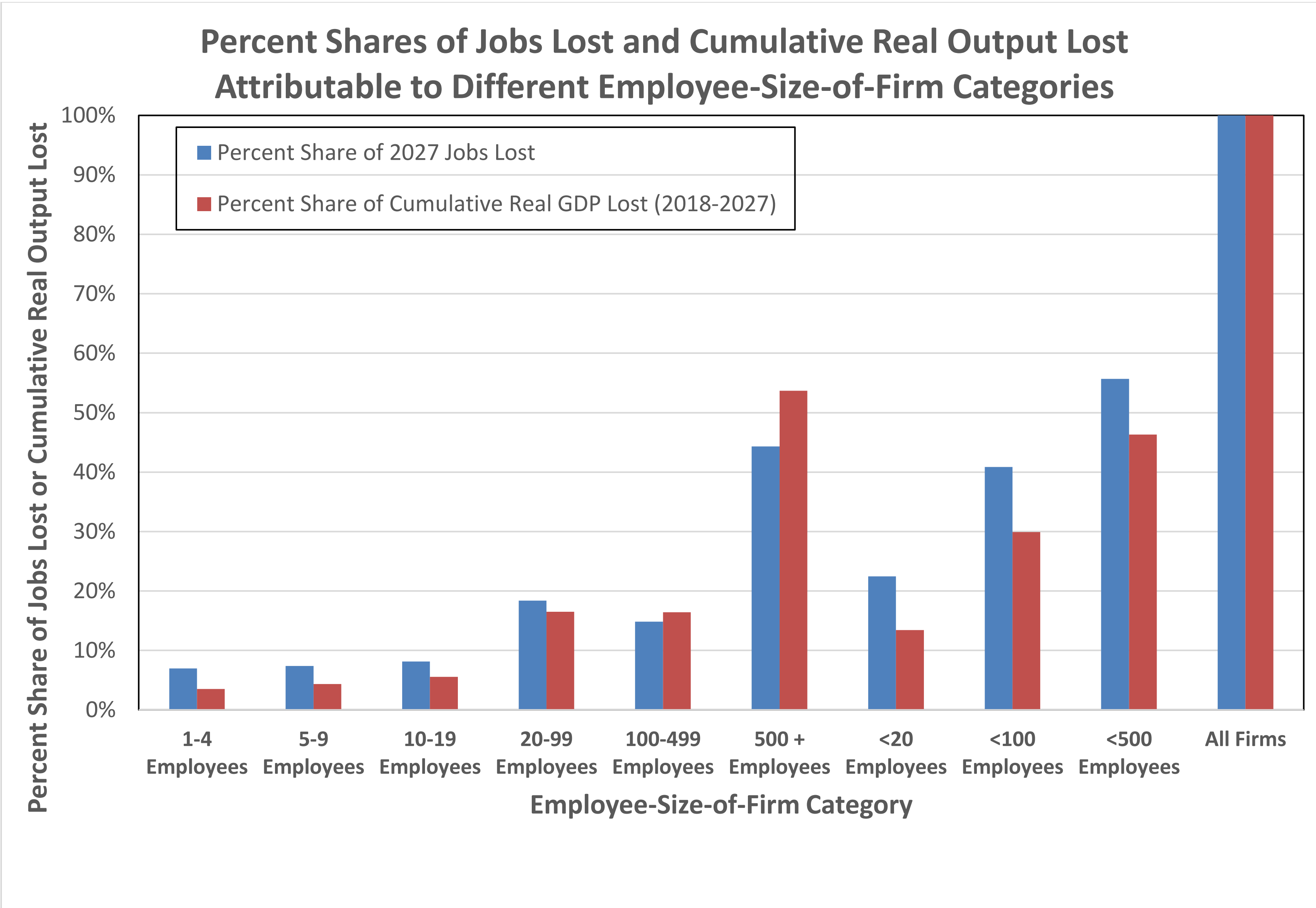

Cumulative Real output Lost from 2018 to 2027
(Billions of 2015 $s)
$0
-$10
-$20
-$30
-$40
-$50
-$60
1-4 Employees
5-9 Employees
10-19 Employees
20-99 Employees
100-499 Employees
500 + Employees
<20 Employees
<100 Employees
<500 Employees
All Firms
-2.0B
-2.5B
-3.1B
-9.4B
-9.3B
-30.5B
-7.6B
-17.0B
-26.3B
-56.8B

Figure 2



Percent Shares of Jobs Lost and Cumulative Real Output Lost
Attributable to Different Employee-Size-of-Firm Categories
Percent Share of 2027 Jobs Lost
Percent Share of Cumulative Real GDP Lost (2018-2027)
Percent Share of Jobs Lost or Cumulative Real Output Lost
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1-4 Employees
5-9 Employees
10-19 Employees
20-99 Employees
100-499 Employees
500 + Employees
<20 Employees
<100 Employees
<500 Employees
All Firms
Employee-Size-of-Firm Category

Figure 3

Appendix: Remarks Concerning Alleged Counterfactual Evidence Regarding Minimum Wage Effects on Employment

Research on the economic effects of minimum wage policy consists of a rich literature spanning decades. This body of literature includes studies whose results contradict the basic economic principle of the law of demand, suggesting that increases in the minimum wage have no impact on low-wage employment and may even have a modest positive effect. This section discusses two popular studies within this counterfactual literature and notes certain methodological problems which introduce uncertainty with respect to their findings.

A controversial and well-cited study on the minimum wage dating from the mid-1990s is Card and Krueger's investigation of the impact of the April 1, 1992 increase in the New Jersey minimum wage from $4.25 to $5.05 per hour.[12] Card and Kruger used a telephone survey to compare the experiences of 410 fast-food restaurants in New Jersey and Pennsylvania—331 in New Jersey and 79 in eastern Pennsylvania—following the increase in New Jersey's minimum wage. The Pennsylvania restaurants included in the survey served as a control group with which New Jersey restaurants (and their experiences) could be compared since, in the authors' opinions, "New Jersey is a relatively small state with an economy that is closely linked to nearby states" and no contemporary increase in Pennsylvania's minimum wage occurred during the time period studied. In summarizing their findings, the authors claim to have found "no evidence that the rise in New Jersey's minimum wage reduced employment at fast-food restaurants in the state." Contrary to conventional wisdom, the authors even found "that the increase in the minimum wage increased employment." In a follow-up study using different data (from the Bureau of Labor Statistics), the authors moderated their conclusion to the following: "The increase in New Jersey's minimum wage probably had no effect on total employment in New Jersey's fast-food industry, and possibly had a small positive effect."[13]

The motivation for Card and Kruger's follow-up study stems from criticism of the methodology employed in the authors' first study. In particular, concerns about noisy measurement, the unit of measure investigated (critics claimed that the study's focus should have been the number of hours worked by employees, not the number of employees itself), and inconsistencies between Card and Kruger's data set and actual payroll data from fast-food establishments in New Jersey and Pennsylvania incentivized the authors to perform subsequent research. These points aside, other criticisms can be made about Card and Kruger's analysis. First, the authors focused on a relatively small geographic area. Second, the authors focused on fast-food *chains*, which are not the same as the fast-food *industry*, which is comprised of both chains and an independent sector. The independent sector has been observed to be "much more labour intensive than the chain sector."[14] This being the case, it is entirely possible for the chain sector of the fast-food industry to experience negligible effects due to a minimum wage increase, while

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[12] Card, David and Alan B. Krueger, "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania," The American Economic Review, Vol. 84, No. 4, Sept. 1994, pp. 772-793.
[13] Card, David and Alan B. Krueger, "Minimum Wage and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania: Reply," The American Economic Review, Vol. 90, No. 5, Dec. 2000, pp. 1397-1420.
[14] Worstall, Tim, "Alan Krueger's Mistake on the Minimum Wage", Forbes, Aug. 31, 2011.

the more labor-intensive independent sector (and the industry as a whole) experiences material negative employment effects due to the minimum wage increase. Third, by focusing on the fast-food industry, Card and Kruger leave out a significant subpopulation of the minimum wage workforce (employed outside of the fast-food industry). Fourth, the New Jersey minimum wage became effective two years after the legislation was passed. It is possible, and perhaps even likely, that some of the reaction among employer firms to the legislation occurred before the new minimum wage came into effect. To the extent that the examined time period excluded some employer's reactions to the minimum wage increase, the change in employment measured by Card and Kruger may be biased upward. Fifth, Card and Kruger focused on nationally-known fast-food enterprises rather than a representative sample of all eating establishments. Such a focus could bias results upward, as national chain restaurants may be better able to absorb wage increases than eating establishments in general. If such is the case, national chain restaurants may even gain market share and expand even as the industry as a whole loses employment.

The second study of some popularity which presents counterfactual evidence on the employment effects of minimum wage policy is much more recent. An article by Allegretto, Dube, and Reich (hereby ADR) published in 2011 asserts that minimum wage increases between 1990 and 2009 had essentially zero impact on teen employment (the authors rule out "any but very small disemployment effects").[15] Their results were obtained using a methodology that accounted for the (according to the authors) prior-to-then ignored "heterogeneous employment patterns that are correlated with selectivity among states with minimum wages." By including control variables for "long-term growth differences among states and for heterogeneous economic shocks," the authors achieve elasticities for employment and hours worked "indistinguishable from zero."

While the approach used by ADR holds some intuitive appeal, a thorough examination of the authors' methodology by Neumark, Salas, and Wascher (hereby NSW) "points to serious problems with [their] research designs."[16] NSW's analysis provides evidence that the tendency for including state-specific time trends into the baseline fixed-effects regression model typically used for minimum wage analysis to eliminate negative employment effects of minimum wages (during the time period studied) is due principally to the strong influence of the recessionary periods of the early 1990s or the Great Recession period. NSW show that when long-term trends are estimated in ways that are not highly sensitive to the business cycle, the estimated effects of minimum wages on teen employment are negative and statistically significant. NSW also address the second methodological technique used by ADR to obtain their counterfactual results, namely, the inclusion of a (Census Division x Period Interaction) term into the regression model. A justification for the inclusion of this term is that omitted factors could drive patterns of teen employment differentially by Census division, and therefore this term should be included to capture those effects. Underlying this approach is the assumption that states within a Census

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[15] Allegretto, Sylvia A., Arindrajit Dube, and Michael Reich, "Do Minimum Wages Really Reduce Teen Employment? Accounting for Heterogeneity and Selectivity in State Panel Data," Industrial Relations, Vol. 50, No. 2, Apr. 2011, pp. 205-240.

[16] Neumark, David, J.M. Ian Salas, and William Wascher, "Revisiting the Minimum Wage-Employment Debate: Throwing Out the Baby with the Bathwater?", Discussion Paper No. 7166, IZA, January 2013.

division make better controls for states where minimum wages increase than are states in other Census divisions. NSW investigate this claim by utilizing two ranking algorithms to assess whether within-Census-division states truly do make for better controls.[17] The two algorithms include a synthetic control approach and a "ranked prediction error" approach. Both algorithms provide evidence which generally question the rationale for restricting control states to those in the same Census division. In light of these results, NSW conclude that "the evidence still shows that minimum wages pose a tradeoff of higher wages for some against job losses for others."

[17] The structures of the algorithms are non-trivial and details surrounding them are omitted from this report. Readers interested in learning more about the algorithms should refer to Neumark et al. noted in footnote 16.